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ABSTRACT

The limitations on educational resources and the increasing complexity in all phases of social organization demand that the educational process become more efficient and effective. A strong opinion among educators suggests that students can learn faster if the educational forces are applied systematically. To achieve this goal, learning objectives for students should be primary and must be communicated in the classroom. Activity that does not involve students is considered secondary or supportive. It is important that the learning objectives be related to the concerns of the consumers of the educational product. The student should understand the learning objectives, perceive their relevance to him personally, and feel that they are attainable. For the educational system to work well, the student and prospective consumer of the educational product should agree on the learning objectives. It is felt that this model will generate useful data for each decision-making level in the educational system. Any internal breakdown of the above outline will indicate an educational need or perceived deficiency in the level of student benefits which decision makers can correct using a consistent base of information. (LN)

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THE FIRST STEP IN EDUCATIONAL PROBLEM SOLVING--- A SYSTEMATIC ASSESSMENT OF STUDENT BENEFITS

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To facilitate communication in this paper, I shall use an explicit and easily followed system of organization. To be found in the following pages are:

(1) A set of major questions to which this paper is addressed (p.1).

(2) A brief answer to each of these major questions (pp. 2-8)

(3) Elaborations in which I shall attempt to anticipate at least the more obvious questions that may arise in the mind of the reader (pp. 9-30)

Thus the substance of this paper will be presented in the first few pages If the reader has questions after reading these pages, it is hoped that he may find at least some of the answers in the elaborations that follow. This system of organization should enable the reader to develop his own cognitive structure of the contents of the paper early in the reading, and then to fill in the gaps in that structure as he feels the need.

A. THE MAJOR QUESTIONS

(1) What is the problem?

(2) What is an educational need?

(3) What is an assessment of needs?

(4) What should statements of need look like?

(5) What methods can be used to obtain statements of need with the characteristics developed in (4) above?

(6) What about validity and reliability?

(7) What about utility?

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B. THE BRIEF ANSWERS

1. What is the problem?

The problem is not simple, yet it may be simply stated. There is widespread conviction among the public, governmental leaders, and professional educators that there are things which large numbers of children are not learning well enough--including perhaps some necessary and/or desirable things which children are not learning at all--and other things which children are learning that they should not. Coupled with this is a second conviction, held somewhat tenuously by many, that childrens' learning can be improved by marshalling forces systematically through and within the framework of the formal educational system. There is a third conviction that new and improved tools are required if this is to be accomplished. These convictions are sufficiently widespread and well known that documentation is hardly needed. Passing reference may be made to a few notable examples in the literature, Coleman (1966), Peterson (1966), Katz and Korn (1968), and the Committee on Assessing the Progress of Education (1968).

From the standpoint of the educational decison-maker, the problem may be stated in terms of information requirements. No matter how intelligent the decision-maker may be, a decision can be no better than the information used in making it. Is there any administrator who does not wish that he could obtain more information---relevant, valid and reliable---on which to base decisions? Obtaining better information for decision-making is a technical problem of mounting importance. Given

(1) that there are severe limitations in educational resources, and

(2) that the complexity of the world in which we live is rapidly accelerating,

it is fast becoming critical for public education to devise more efficient and more effective systems of inquiry that will provide information to aid decision-makers at all levels of the educational system in setting priorities for the allocation of resources on a rationally defensible, educationally meaningful basis (e.g., see State Committee on Public Education, 1968). Further, it is necessary that the prime focus of inquiry be student learning needs if the basis for decisions is to be in fact educationally meaningful and rationally defensible.

2. What is an educational need?

The concept of educational need is whatever we say it is. It is a matter of definition. The primary criterion to be used in formulating our concept and in evaluating it is: how workable is it in making decisions related to solving educational problems? I would propose the following definition: An educational need is a perceived deficiency in the level of student benefits.* The key words in the definition are perceived deficiency and student benefits.

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*This definition is a special case of Kaufman's more general definition of a need as the discrepancy between what is and what is required (Kaufman, 1968).

a. The term student benefit refers to any performance or behavioral capability or any feeling that the student acquires as a result of his experience within the school system.

b. The word deficiency implies a scale of some kind, used either intuitively or deliberately, to measure the level of student benefits.

It may be noted in passing that this definition raises the possibility of negative benefits, i.e., the things a student may learn in school that are considered undesirable.

c. The word perceived immediately raises the question as to who does the perceiving. The answer has to be that the person or group of persons who have the responsibility of making decisions regarding the allocation of resources must do the perceiving. No matter what kind of information is made available for decision-making, in the final analysis the setting of priorities is judgmental. The question still remains as to what information may be made available as a basis for making such judgments. The question is at the heart of the concern of this paper.

3. What is an assessment of needs?

An assessment of needs is a process by which information is made available to decision-makers at the time they need it to make decisions. The process includes the following steps: (1) deciding what information is to be collected; (2) developing procedures for collecting it; (3) collecting information; (4) processing and analyzing information; and (5) presenting information to the decision-makers. Obviously, those persons who will use the information must be involved in the process, particularly at step (1) and again at step (5) in receiving information and acting upon it.

4. What should statements of need look like?

Statements of need should conform to whatever definition of educational need is adopted. Further, they should contain whatever elements of information are necessary to define specific educational needs, establish priorities among them, and provide direction toward devising solutions for meeting them.

Statements of need should have the following characteristics:

a. Focus on student needs. The statement should be concerned with student needs, or deficiencies in student benefits, not institutional needs. Institutional needs are of consequence only to the extent that they are related to student needs. Institutional needs are dealt with in planning solutions, not in the needs assessment itself.

b. Identification of target groups of students. The statement should include the identifying characteristics of the students who have the need, how many students are involved, and where they are located.

c. Criterion. There should be some explicit criterion, or set of criteria, for judging where the schools are now in relation to the need, i.e., establishing a baseline, and for eventually judging the extent of progress in meeting the need.

d. Criticality of need. In order to set priorities, it is necessary to have some index of the importance of each need in terms of the value society places upon eliminating or at least reducing it.

e. Size of statement. The size of the statement has to do with the level of abstraction, or the level of generality of the statement. The size of the statement of need must be appropriate to the response capability of the decision-making body that must deal with it. The response capability is in turn determined by the nature and the amount of resources that the decision-makers may bring to bear in finding a solution. It may be noted in passing that, in any system, decisions should always be made at the lowest possible level, i.e., the lowest level that has resources to deal with a given need (see Koestler, 1967). To the extent that decisions are made at levels higher than necessary, the system is inefficient.

f. Current commitment of funds. There should be an indication of the current commitments of funds, if any, toward meeting the need. This is important from the point of view that priorities should be set in terms of perceived inbalance between benefits and costs. The first five characteristics of a statement of need have to do with student benefits. Cost factors must also be considered, however, before a decision can be made on the appropriate action to be taken. It may be the case that a given set of benefits is costing too much, and the problem is to find a way to reduce costs, or perhaps the level of benefits should be increased, keeping the costs within certain bounds. The relationship between benefits and costs, of course, is extremely important from the standpoint of program planning and budgeting (e.g., see Hatry, 1966).

5. What methods can be used to obtain statements of need with the characteristics stated in 4 above?

A methodology or model for assessing needs will be proposed here. First, it is of importance to specify what the essential assumptions are behind the operation of the model.

Assumption 1

The prime focus for an assessment of needs should be the learning objectives toward which students are expected to work. This means that the focus is primarily on what takes place in the classroom, for it is in the classroom for the most part that learning objectives are communicated in some form or fashion to the students (and in some cases from the students to the teacher) and some kinds of structured learning activities take place. Every other type of activity in the educational system that does not involve students is considered to be supportive in nature.

Assumption 2

The learning objectives as communicated in the classroom should be viewed in relation to the concerns of the appropriate consumers of the educational product.*

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* The concept of "consumer of the educational product" is discussed fully on p. 13.

Assumption 3

IF a student

a. understands what is expected of him, i.e., he understands a given learning objective that the educational system expects him to reach,

b. "buys" the objective, i.e., he perceives that the objective is relevant for him personally, and

c. feels that his efforts to reach the objective will have a "payoff," i.e., that the objective is attainable for him personally,

THEN the desired learning will take place.
Obversely, if any one of the above three conditions is not met, then the desired learning will NOT take place.*

Assumption 4.

IF

a. the educational system, the student, and the prospective consumer of the educational product all agree on the relevance of a given learning objective, and

b. both the school system and the student perceive the objective to be attainable,

THEN the educational system is working well in respect to that objective.

Obversely, if either of the above conditions is not met, then the educational system is NOT working well in respect to that objective.

In case the obverse of Assumption 4 holds in the instance of a given learning objective or cluster of learning objectives, then this is a symptom of educational need.

There are four basic steps in the operation of the model:

Step One. Teachers formulate behavioral objectives for what they are now doing in the classroom.**
Step Two. Teachers take their behavioral objectives to their students and elicit student perceptions of these objectives. Student responses are obtained on three dimensions: (1) understanding of the learning objective; (2) the perceived relevance of each objective for the student personally; and (3) the perceived attainability of each objective for the student personally. Students formulate additional objectives they would like to see added to the course or subject area.
Step Three. These behavioral objectives from both teachers and students are taken to appropriate groups of consumers of the educational product to obtain their perceptions of the relevance of objectives to their concerns as consumers. Consumers also suggest additional objectives relevant to their concerns.

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*The validity of this assumption is discussed on p. 16.
**The difficulties in obtaining behavioral objectives from teachers are discussed on p. 15.

Step Four. These data are cast into a single matrix showing patterns of disagreement among representatives of the educational system, students, and appropriate consumers of the educational product. These patterns of disagreement may be categorized according to a typology of such patterns to indicate the nature of the need and the general strategy of solution that should be employed to resolve the need.*

Can we obtain statements of need having the characteristics specified under question 4 above using these procedures? Let us consider the data in respect to each characteristic.

a. There is definitely a focus on student needs, as opposed to institutional needs. Since the data consist of perceptions of specific learning objectives, and since it is the attainment of these objectives that constitutes student benefits, the data are consistent with our definition of an educational need.

b. The data lend themselves to identification of groups of students. The characteristics of the students for whom objectives have been formulated may be obtained as required, e.g., grade level, sex, age, ethnic background, socio-economic background, previous school record, location, etc.

c. The criterion must ultimately be the satisfaction of the consumer of the educational product. However, if our fourth assumption is indeed true, then one reasonable measure to be employed as an index of this criterion is the extent of disagreement among the three groups in their perceptions of a given learning objective or cluster of learning objectives. The extent of disagreement should be measured by the magnitude of discrepancies in perception and the number of students directly affected.

d. It is proposed that criticality is related to the following factors: (1) the magnitude of a disagreement among the three groups in the perception of a given learning objective or cluster of objectives; (2) the number of students directly affected by a disagreement; (3) the importance of a given learning objective to the concerns of appropriate consumers; and (4) the importance of the consumers' concerns to society at large.

The first three factors may be obtained from an analysis of the data on perceptions of learning objectives, as previously discussed, and the fourth may be obtained from the judgments of a blue-ribbon panel of experts selected for the purpose. A coefficient of criticality may be derived by combining the factors. In order to establish the criticality of a perceived deficiency in a given cluster of benefits, the coefficient of criticality may be added across the individual objectives involved, thereby producing a single index.

e. The size of the statement is accommodated. The size of the statement may be manipulated according to the size of the cluster of objectives in the presentation of data. For decision-making at the classroom level, individual objectives as the teacher formulates them may be considered. However, data may be summarized for objectives grouped by course, by subject area,

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*A formal presentation of the model is made beginning on p. 19. The matrix for presenting the data is discussed in detail beginning on p. 24.

by school or district, by student or by groups of students with certain characteristics, by attributes of the objectives themselves, etc.

f. With the movement in the direction of program planning and budgeting, it should eventually be possible to determine the cost of achieving given learning objectives for given numbers of students. Until that time, it would be feasible to develop cost estimates for given clusters of objectives in terms of courses or groups of courses, considering the cost of equipment and materials, maintenance, the prorated salaries of teachers, administrators, and support personnel, etc.

6. What about validity and reliability?

The validity of the needs assessment model depends upon

(1) the degree to which the rationale and procedures as presented appear reasonable and workable on an a priori basis, i.e., face validity;

(2) the extent to which Assumption 3 in particular can be empirically supported; and

(3) ultimately, the consumption of the educational product---the satisfaction of the consumer.

Among the assumptions of the model, Assumption 3 is the most immediately testable. The three conditions for learning specified by this assumption should have a high degree of power for predicting student mastery of given learning objectives. Therefore, the relationship between these variables and actual student achievement is important in validating the model. (see p.

Since the consumption of the educational product is a continuing, long-term affair, validation must also be continuing and long-term. However, it is possible to obtain information upon which to base a reasonable judgment about validity through examining the initial phase of consumption. This should be done through conducting follow-up studies of the graduates and other former students of school systems, empirically determining the pattern of consumption of the educational product. If the skills, knowledge, and attitudes that are the learning objectives are acquired by the students and are then "consumed" in the real world, the purpose of education has been fulfilled.

Reliability is a statistical matter and depends upon the quality of the instrumentation for making the model operational and upon the standardization of procedures for collecting the data.

7. What about utility?

In addition to the question of validity, the other primary criterion for evaluating an assessment of needs is the utility of the results. In the preceding sections, emphasis was placed upon providing information to educational decision-makers about deficiencies in the levels of student benefits for the

purpose of defining specific educational needs, establishing priorities among them, and providing direction toward meeting them. How well the results of a needs assessment lend themselves to use for these purposes determines the utility of the study.

There has been no deficiency in the quantity of statements about educational needs available to anyone who has taken the trouble to examine the educational literature or the mass media. The problem with most statements of need available to us is that they lack precision and that they are usually presented with inadequate validation and almost never with any basis for setting priorities among them. Such statements ordinarily lack any real utility.

C. ELABORATIONS

This part of the paper is devoted to discussion of the more obvious questions that may arise in the mind of the reader. In the order presented, these questions are:

(1) What about existing data and current procedures for assessing needs? (pp. 9-13).

(2) What is meant by "consumer of the educational product"? (pp. 13-14).

(3) Can teachers formulate objectives? Should teachers formulate objectives? (p. 15).

(4) Can future educational needs be assessed using these procedures? (p. 16).

(5) Is there evidence to support the assumptions behind the model? (pp. 16-18).

(6) Can the model be represented formally? (pp. 19-27).

(7) Has the model been tested? (pp. 27-30).

We proceed immediately to the first question.

1. What about existing data and current procedures for assessing needs?

It does not seem reasonable to ignore the vast quantities of existing data and the methods of collecting and processing them. Use of the needs assessment procedures advocated in this paper does not preclude use of other data as well, in an appropriate context. There is no ultimately good and useful way of assessing educational needs, no final answer to the question of how best to do it. There may always be a better way---more efficient, more valid, and more useful.

At the present time, however, decision-makers do not have access to the kinds of data that may be provided by the model proposed here, and it would seem on an a priori basis that this information is vital to an assessment of needs leading to meaningful decisions about instructional changes.

Existing data tend to fall into four general categories:

(1) the characteristics of solutions toward meeting needs;

(2) the opinions of the general population and of various subgroups of the population about needs;

(3) achievement test results; and

(4) indices of consumption of the educational product.

Characteristics of solutions. Examples of this kind of data are teacher characteristics, time spent in instruction on given subjects, the nature of instructional materials and equipment being used, class size, etc. These data are very important in educational planning. However, they relate to the variables of instructional process, rather than product. The purpose of the educational institution is not that teachers should have certain characteristics or that classes should be of a certain size, but rather that students should receive certain benefits. Experience has shown that this is a very elusive distinction, simple though it may seem in stating it.

Even if the distinction is allowed, it still might be maintained that an assessment of needs should include both kinds of data, i.e., information on product and process. If both kinds of data are considered desirable, then the model should be designed to accommodate both kinds without muddying the conceptual waters. It should be remembered that a perceived deficiency in a process variable has genuine significance only in relation to a perceived deficiency in a product variable. A primary reason for our failure to meet needs in the past has been our blindness to this relationship. The relationships between process and product are critical to the successful planning of solutions, but are not necessary to the identification of deficiencies in the product itself.

Current approaches to opinion polling. One example of the second kind of data is the results of the needs studies conducted by, or under the auspices of, most of the Supplementary Education Centers in California funded under Title III, ESEA. Another example is the response to questions occasionally asked by the professional opinion pollsters. One of the best needs studies conducted by a Title III Center was that of Kase (1967). An example of the work done by professional pollsters is Field Research Corporation (1967).

In using such data in assessing needs, there is an underlying assumption that the pooled perceptions of many different kinds of people in the community constitute fairly accurate and reliable information. It is assumed that the larger the number of persons who "recognize" a particular need, the greater the likelihood that the need exists, and the greater the probable cost to society if the need is not met, or at least reduced. This assumption may hold for the most critical needs, which tend to be highly visible, but how good is it for detecting needs which are not yet readily discernible to the public eye?

A particular difficulty with these data is that without considerable probing during an interview, one is never really certain what led to the development of a respondent's perception of need. In other words, there is the problem of ascertaining the validity of perceptions. One way of handling this problem is to interview a large representative sample of the population and then proceed on the faith that invalid statements will tend to become lost in the shuffle of data, or simply cancel out somehow. This statistical approach, however, is somewhat questionable because, in the case of assessing educational needs, it may be that the perceptions of only a few persons are actually valid. The perceptions of the majority of persons may in fact be invalid.

Another kind of difficulty in going to a large sample of respondents and asking them to identify educational needs is that if the questions are not structured very tightly, the answers are forthcoming in a wide variety of forms

and at various levels of generality. It is then exceedingly difficult to use the data to develop statements of need having the characteristics presented on page 3. Consequently, what frequently happens is that the needs statements generated by a survey of the community must then be subjected to considerable post facto analysis to break them down into something both meaningful and manageable, if in fact this can be accomplished at all.

Achievement tests. Examples of the third kind of data are standardized testing programs and grades given by teachers. This kind of data is the only one currently available that has to do directly with educational product. Teacher grades have never been considered sufficient for measuring educational product on a wide scale. In fact, standardized testing was developed to overcome the objections to using teacher grades. Grades are specific to the class in which they are given, and the units of measurement involved in a grade are usually unknown. Further, grades usually compare one student with another, rather than measuring each student's achievement in respect to given objectives without reference to other students.

In standardized testing, on the other hand, the units of measurement are known, and the scores are not specific to the instructional content of a given class. There is no doubt that standardized tests are useful in providing information for comparing one group of students to another in their achievement on a given set of items. However, such tests will not provide a systematic assessment of need---will not measure the true extent of learning of given students---because curricula are not standardized. It is well known that there is increasing emphasis on individualizing---or further "de-standardizing"---instruction (e.g. State Committee on Public Education, 1968). One can only imagine how many objectives of the individual district, school, and classroom teacher are not measured by any standardized test---and perhaps objectives of considerable importance.

Standardized tests are normative in nature. We ought to be concerned with criterion-referenced tests to generate baseline data for making instructional changes (See Glaser,1963). Normative testing is designed to compare students with each other by providing a score for each student to indicate his performance relative to other students who have taken the test. To this end, item analysis in the development of such tests is aimed at selecting those items which provide maximum discrimination among students. Criterion-referenced testing, on the other hand, is designed to measure the student's performance in terms of the extent to which he has mastered a given set of objectives, without reference to the performance of any other student. In other words, if the test is constructed to truly represent the extent of learning, then it does not matter whether an item does not discriminate among students who took the course. Rather, the important discrimination must be between those students who took the course and those who did not.

This is not to say that one will not obtain a discrimination among students who took a course by administering a criterion-referenced test, but rather that such discrimination is not the aim of the test. A normative test, which maximally discriminates among students who took the course, may not truly represent the extent of learning for all students.

I think this distinction between criterion-referenced testing and normative testing is an important one if we are to understand the nature of testing that ought to be used in a needs assessment. Unfortunately, the development of criterion-referenced tests requires large amounts of money and great lengths of time (see Newmark and Sweigert, 1966). It is presently not feasible to use this type of test in assessing needs.

It should be made clear, however, that the model for assessing needs presented here is not proposed as a substitute for achievement testing, whether standardized or otherwise. What is proposed is an inquiry system for generating self-report or perceptual data from teachers, students, and consumers of the educational product on the grounds that such data would be exceedingly useful in defining educational needs and pointing the way toward desired instructional changes.

The relationship between need assessment and evaluation should be readily apparent from an examination of Kaufman's problem-solving model (Kaufman, 1968). Guba (1969) has referred to the need for concepts of evaluation which would stimulate program improvement. This requires providing evaluative data early enough in conducting a program so that the data may be used to detect weaknesses. One of the strong points in obtaining student perceptions of objectives as evaluative data is that the measures may be obtained at the beginning of an instructional sequence (perhaps one or more times <u>during</u> the sequence also) and used diagnostically to improve instruction.

<u>Indices of consumption of the educational product</u>. As examples of the fourth kind of data, there are statistics on unemployment, juvenile delinquency, illicit use of drugs, welfare programs, public health, etc. Most public agencies collect data pertinent to their programs, and much of these data seem to relate to educational needs in some way. Here again the difficulty is with data in a variety of forms, collected and analyzed using a variety of procedures to serve many different purposes, thus making it practically impossible to put the data into a common format that would be readily usable by educational decision-makers as prime sources of information in setting priorities. Furthermore, most of these data involve social problems for which education shares the responsibility with other public agencies. When problems are formulated in such general terms, it is virtually impossible to solve them unless the specific areas of responsibility of education and other public agencies can be determined.

Nevertheless, I would suggest that such data may be useful, with careful interpretation, as partial indices of the consumption of the educational product. For the most part they consist of data collected in the world outside the educational sphere and thus involve to some extent an independent indication of the nature and quality of the educational product.

Excellent examples of more specific data on consumption of the educational product are to be found among follow-up studies conducted by a few local school systems. There seems to be increasing interest in doing longitudinal studies of the patterns of success/failure among former students of a school system. (For example, East Side Union High School District, San Jose, California, 1969; Oakland Unified School District, Oakland, California, 1967-1969; the

Bureau of Pupil Personnel Services, California State Department of Education, report in press.) The follow-up study is an essential part of assessing needs. (See the next section on "consumer of the educational product.")

The national assessment of the progress of education is a different kind of standardized testing which should provide very useful information about the general pattern of consumption of the educational product. (See Tyler, 1966). However, the national assessment program is not designed to provide data specific to classrooms, schools, or districts. The results of national assessment if carefully interpreted, may nevertheless provide a useful validity check of the results of studies done within districts.

2. What is meant by "consumer of the educational product"?

It is not customary to think in terms of consumers of the educational product. For any given student, there are many learning objectives and many consumers of the knowledge, attitudes, and skills he acquires. The student himself, or the person he will become as he matures, is perhaps the primary consumer. Who the consumers are in any given case and the quality of the product consumed may be empirically determined through follow-up studies.

One possible classification of consumers, presented for illustrative purposes only, is the following: (1) employers; (2) universities and colleges; (3) post high school technical or vocational schools; (4) the military services; (5) parents; (6) voters; (7) graduates and former students of the public school system; (8) present students of the school system; and others. These categories are fairly gross, but they do provide some idea of what is meant by a consumer and the range covered by the term.

In a free society, a person may choose his own life goals within a tremendously broad range of alternatives. Consequently, a student determines who the consumers will be for him personally. If a student decides to attend a particular university (and he is admitted), that university becomes a consumer of those educational products offered by the student that are relevant to success or failure within the institution of higher learning. This is true, however, only because of the initial selection by the student.

A very poignant illustration of this principle is provided by the so-called "hippie" culture. It is not illegal to be a hippie, even though the dominant society may frown upon it. The young people who become hippies, with varying amounts of education, select a pattern of consumption of the educational product that is radically different from existing norms.

Most consumers are selected by the student <u>after</u> he leaves the school system. The exceptions to this general rule are the parents, the voters who support the system, and at this point in time, military service. Thus the student at least tacitly selects tentative classes of consumers (if only by default), and the educational system must provide learning objectives that are relevant. The

consumer, on the other hand, must be made aware of these objectives in order to validate their relevance to his concerns as a consumer.

It is through this proposed inquiry system that specific learning objectives may be tested for validity in terms of real world requirements. From the perceptions of the consumer, criteria may be developed for determining present baselines and societal expectations. Each consumer may be considered an expert about that part of the educational product which he consumes directly.

3. Can teachers formulate objectives? Should teachers formulate objectives?

A great deal has been published about behavioral objectives. Burns (1969) has noted that a complete bibliography including all articles and books concerned with aims, goals, and objectives for the years 1955 through 1968 would name over one thousand sources. Much less has been published on how to construct a behavioral objective. Perhaps the best known sources on constructing objectives are Mager (1962, 1968), Popham (1967), Bloom et al (1956), and Krathwohl et al (1964).

The operation of the model presented here depends upon the assumption that the appropriate place to begin an assessment of educational needs is to determine what it is that the schools are now working to accomplish (Assumption 1). This is consistent with the first step in Kaufman's problem-solving model, which is to "identify and define what is."

The position taken here is that to obtain information about what the schools are currently working to accomplish, teachers should be asked. This is not to say that teachers have the sole or even the prime responsibility for determining learning objectives. Nevertheless, whatever superintendents, or school boards, or curriculum supervisors may say the objectives ought to be, it is the form in which they are translated into action in the classroom that is critical. It is in the classroom, or anywhere else that school personnel interact with students, that objectives become operational, whether they are explicit or implicit.

It would seem reasonable, therefore, that teachers should be able to say what these objectives are. In fact, given Assumption 3 in the model presented here, it could be argued that the prime functions of teaching should be to explain to the student what is expected of him, to establish the relevance of what is expected of him, and to provide conditions (materials, equipment, time, etc.) optimally conducive to enabling the student to perform. It is axiomatic that the student learns by doing. Therefore, the student should begin performing incrementally in a manner calculated to move him in the direction of the objective. Not only the extent of learning, but also the efficiency of learning depend upon the teacher's ability to communicate effectively with the student in guiding his performance.

It is not really necessary for the teacher to be able to formulate behavioral objectives in order for the need assessment model to operate. For whatever the teacher thinks the objectives are and in whatever manner he communicates these to the student, the resulting data are input to the discovery of needs. Objectives are not to be evaluated in terms of whether or not they are consistent with formal criteria for behavioral statements, but rather in terms of student and consumer perceptions of objectives, however they may be stated. To the extent that the teacher cannot communicate objectives effectively to the students, that is the immediate problem. One may hypothesize, however, that learning objectives meeting the criteria for behavioral statements will be more likely to communicate to students than will objectives that do not.

4. Can future educational needs be assessed using these procedures?

To the extent that the consumer, or perhaps an expert who has studied the trends in the concerns of a given type of consumer, can make valid projections as to the skills, knowledge, and attitudes that may be required by that type of consumer in x number of years, these procedures can be used to assess future educational needs. Future skills, knowledge, and attitudes would be included in the consumers' contribution to the data. Where appropriate, the expert with special knowledge about future trends would be called upon to represent the consumer in specifying learning objectives relevant to future consumer concerns.

5. Is there evidence to support the assumptions behind the model?

A set of assumptions can seldom be stated in final form at the outset. Good assumptions must be carefully constructed and then revised as necessary. However, a basic tenet of building assumptions is to start simple and then modify only as the evidence requires it. Experience may eventually call for modification of any of the assumptions in order to make the model operational.

Perhaps nothing more need be said at this point about Assumptions 1 and 2, which have high face validity and are consistent with the proposed definition of educational need. Assumption 3, however, may be a bit more esoteric than the others, though it also would seem to have relatively high face validity.

This assumption, it will be recalled, specified three conditions considered collectively to be both necessary and sufficient for desired learning to take place. These were: (1) the student understands what is expected of him; (2) he perceives the relevance for him personally of what is expected of him; and (3) he perceives that he may attain what is expected of him. This is, to say the least, a high-powered assumption if it can be supported. In practice, it is undoubtedly the case that the relationship between these conditions and desired learning is probabilistic, i.e., if the conditions are met, there will be a tendency for learning to take place. The predictive power of these conditions taken collectively will then depend upon the strength of this tendency in real classroom situations. The assumption has been stated in the strongest (and simplest) form at the outset, but because meeting the three conditions will in practice be a matter of degree and because the measurement of the conditions and of the learning that takes place will always be subject to some error, perfect prediction will never be possible. The predictive power of these three conditions is a matter to be determined empirically.

However, there is a strong prima facie basis for the terms of Assumption 3, and there is also research evidence consistent with it. It would seem reasonable to say that the student will learn what he is expected to learn only if he understands what he is to do. Katz and Korn (1968), on the basis of their exhaustive study of college students, reported that many students spend years in school in "bewilderment about what exactly is expected of them." Even if they do well enough to make passing grades, the inefficiency of attempting to learn when the objectives are not understood would appear intolerable.

It would also appear to be necessary on the face of it for the student to perceive the relevance for him personally of what he is expected to do. The fact that the word relevance has become a shibboleth of student protest is not insignificant. The model is not concerned theoretically with what makes an objective relevant, but only with whether or not it is perceived as relevant.

In their work on achievement motivation, Atkinson and Feather (1966) reported that the tendency to "approach a task with interest and the intent of performing well" is influenced by three variables: (1) the perceived likelihood of success in the activity; (2) the incentive value of success in the activity; and (3) the general motive to achieve. There is some degree of correspondence between these variables and the terms of Assumption 3, though it should be pointed out that the theory of need achievement from which these variables were derived is concerned with a relatively small domain of behavior, namely a striving after success for its own sake without reference to any other motive. Atkinson and Feather comment that achievement-oriented activities are usually also motivated by extrinsic factors attributable to other kinds of motives and incentives.

However, the perceived likelihood of success in the Atkinson and Feather formulations bears some similarity to perceived attainability in the present model. Further, the incentive value of success corresponds to the concept of perceived relevance. The general motive to achieve, i.e., need achievement, may be considered as a kind of generalized goal, and the consumer of "success for its own sake" is obviously the student himself. The present model takes the point of view that what makes a particular learning objective relevant, or of value, is its relationship to a goal of the student. Thus the learning objective has incentive value to the extent that it is perceived by the student as enabling him to move closer to one of his goals. This goal, whatever it may be, is similar in concept to need achievement. In fact, it could be maintained that need achievement is a special case in a general class of student motives and thus may be subsumed under the present model.

The question may still be raised as to how these factors relate to performance in a given activity. Two studies by Feather (1965, 1966) are of particular significance here. Feather found that there was a tendency for performance scores to relate positively to initial probability estimates of success when the actual difficulty of the task at hand was truthfully represented to subjects. Under this condition, personality variables such as need achievement and test anxiety had less influence on the probability estimates than when subjects were not told the truth. Information about the task (behavioral objectives, if you will) provided basic cues to subjects in making judgments as to the likelihood that they would succeed at the task. When subjects had such cues, they could draw upon their past experience at similar tasks of that general difficulty level to guide them in making their estimates. When subjects were not given accurate and truthful information about the task (when they did not understand what was expected of them), the relationship between performance and estimates of the likelihood of success disappeared.

It may be noted in passing, Coleman (1966) reported finding that the factor most significantly related to student achievement, among the variables he investigated, was the student's feeling of control over his environment and

destiny. This is consistent with Feather's results. The student's feeling of control over his environment is a direct result of his history of success/failure and would be reflected in his probability estimate of success.

There is strong prima facie support for Assumption 4. Consider for a moment what might be the simplest conceivable example of the educational institution operating within the larger social environment. Perhaps the simplest example is one teacher and one parent talking about one student, who talks to both of them. The teacher represents the educational institution; the student represents the purpose of that institution; and the parent represents the larger society that mandates and supports that institution.

This is also the simplest example of a needs assessment. The parent and the teacher talk about little Johnny's learning, and, of course, little Johnny has had his say in some form to both the teacher and the parent. When this simple system breaks down, needs do not get properly assessed. If any one of the three does not talk to one of the other two, or if there is serious misunderstanding, on an educational subject, there is an element of dysfunction in the educational process.

If the teacher does not communicate successfully to Johnny, the desired learning will very likely not take place. If Johnny does not communicate successfully to the teacher, the teacher will not know whether or not Johnny has learned. If Johnny does not communicate successfully to his parents about his school activities, the parents will probably find their desires and concerns as parents frustrated, for parents, from their own point of view, are very likely assessing the effects of school on Johnny. If the parent does not communicate his approval of school to Johnny, the learning process may be seriously impaired, for parental reinforcement is important to the motivation of the student. If the parent does not express his feelings about Johnny's learning to the teacher, the teacher has lost one valuable index of his success with Johnny, and also perhaps financial support. If the teacher is unable to communicate successfully with the parent, this is also detrimental to continuing community support of the educational enterprise. Therefore, there should be clear channels of communication among the three types of persons: teacher, student, and parent. When communication is successful among these three, the educational system in our simplistic example is operating well.

The parent, of course, is just one of many different kinds of consumer of the educational product. The simplistic model developed above may be extended to include all the consumers. Now, obviously the teacher does not talk to all the different potential consumers of the educational product, nor do they talk to him. But suppose such a dialogue could be instituted and carried on in a systematic way, and suppose this kind of dialogue could be used to generate information that was useful, not only to the teacher, but to various decision-makers at higher levels in the system. Suppose the educational agency were able to conduct this kind of data-generating dialogue about learning as an inquiry system for assessing needs.

6. Can the model be represented formally?

Figure 1 shows a graphic representation of the model, in which -

S is any given student;
E is any appropriate representative of the public school agency operating the school attended by student S;
C is a consumer of the educational product; and
O is a given learning objective, as specified by E, S, or C.

The arrows indicate perceptions of relevance/irrelevance or attainability/unattainability. Considering relevance only for the moment:

S$\longrightarrow$O is the student's perception of a learning objective O in terms of its relevance to achieving his personal goal(s).
E$\longrightarrow$O is the educational agency's perception of learning objective O in terms of its relevance to the agency's educational mission.
C$\longrightarrow$O is the consumer's perception of learning objective O in terms of its relevance to his concern(s) as a consumer.
S$\longrightarrow$E is the student's perception of educational agency E in terms of its relevance to him as a means to achieving his personal goal(s).
S$\longrightarrow$C is the student's perception of a given concern of consumer C in terms of its relevance to achieving his personal goal(s).
E$\longrightarrow$S is the educational agency's perception of student S in terms of his relevance to its educational mission.
E$\longrightarrow$C is the educational agency's perception of a given concern of consumer C in terms of its relevance to the agency's educational mission.
C$\longrightarrow$S is the consumer's perception of Student S in terms of his relevance to a given concern of the consumer.
C$\longrightarrow$E is the consumer's perception of educational agency E in terms of its relevance to meeting a given concern of the consumer.

For present purposes, relevance may be considered as a dichotomy --- either something is relevant to something else or it is not. This dichotomy may be represented symbolically with a plus or a minus. If it is perceived that two things are relevant, e.g., a student perceives the relevance of a given learning objective to his own goals, this condition may be indicated by a plus sign. If it is perceived that two things are irrelevant, e.g., a student perceives that a given learning objective is irrelevant to his own goals, this condition may be indicated by a minus sign. Thus

S$\overset{+}{\longrightarrow}$O indicates that the student perceives the relevance of learning objective O to his personal goal(s).
S$\overset{-}{\longrightarrow}$O indicates that the student perceives the irrelevance of learning objective O to his personal goal(s).

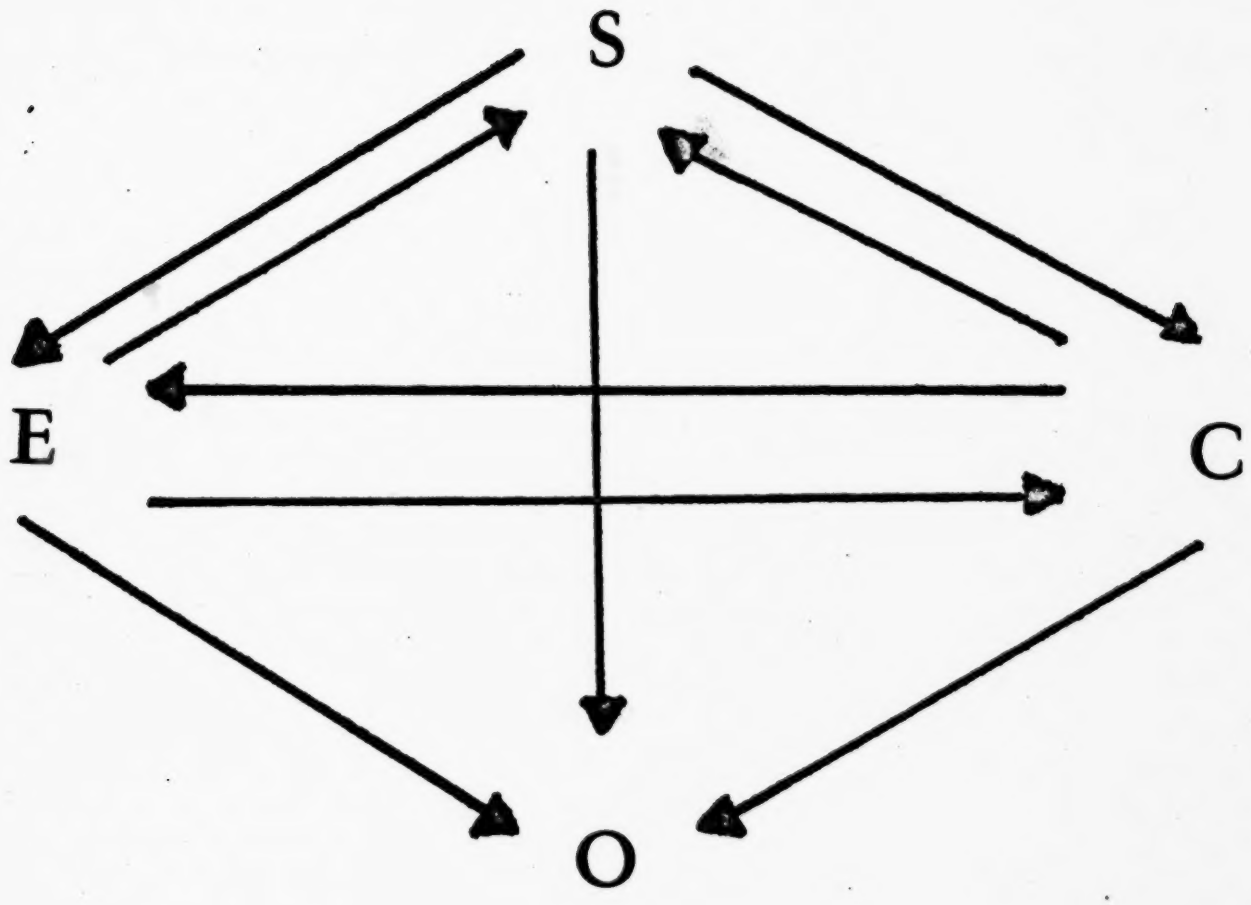
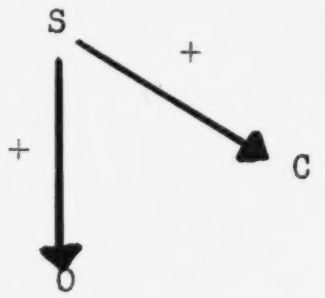


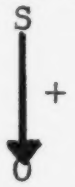
Fig. I

A Graphic Representation of the Model

From these basic elements and their perceptual interlinkages as defined above, a diagram may be constructed to graphically represent the concept of educational need being developed here. Consider the following diagram:

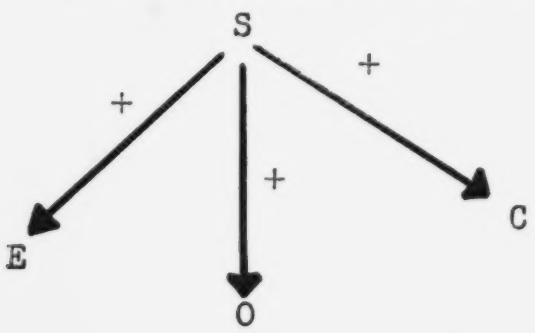


This subsystem of the diagram presented earlier indicates the student's perception that learning objective O is relevant for him personally in terms of a given concern of consumer C. The concern of consumer C is in turn relevant to the student's personal goals. In other words, learning objective O is perceived by the student as a means to the achievement of a goal which may be obtained through C, or by way of some association with C. It is implied, of course, that the student also "understands" O. It may be pointed out that if the attainability factor is added to this subsystem such that



indicates learning objective O is perceived by the student as attainable, the conditions of Assumption 3 have been satisfied.

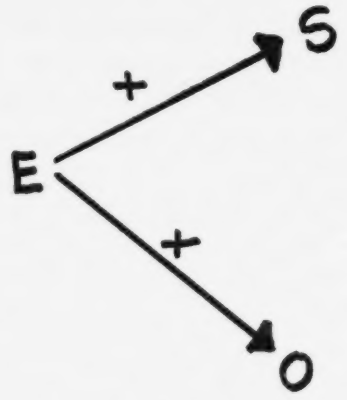
The question may be raised as to whether or not all conceivable learning objectives would fit this type of dual consideration. If it is allowed that in some special cases S and C may be the same person, i.e., that for some kinds of learning objectives, the student is the consumer as well as the product, then the diagram has comprehensive generality. (In a certain sense the student is also a consumer in respect to any learning objective, but reference is made here to the case in which there is no consumer other than the student himself.) Another element may be added to the diagram to produce the following:



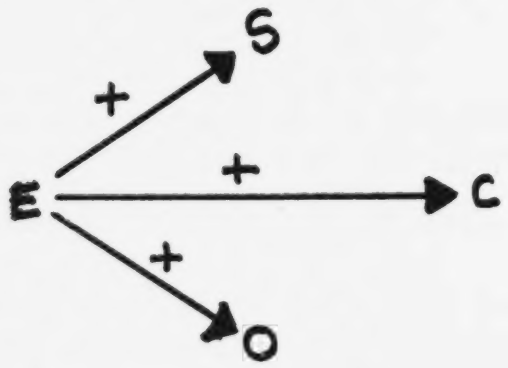
This configuration indicates the student's perception that learning objective O is relevant for him personally in terms of a given concern of consumer C and that the educational agency E is relevant in terms of providing opportunity for the student to master learning objective O. At this point, a member of

each of the three reference groups has been introduced into the diagram--a student, an educational agency, and a consumer--and related to O through the perception of S.

A similar subsystem may be constructed from the point of view of either the educational system or the consumer. Consider the following:

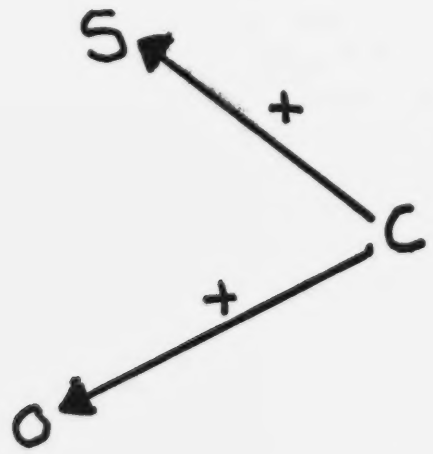


Here is a subsystem indicating the educational agency's perception of the relevance of learning objective O to its educational mission in respect to student S. If the consumer is added, the diagram becomes:



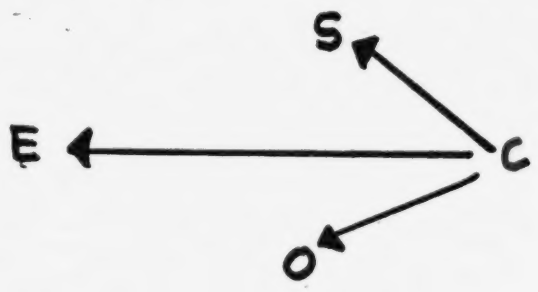
This subsystem indicates the educational agency's perception that learning objective O is relevant to its educational mission for student S in terms of satisfying a given concern of consumer C. (This concern of consumer C, it must be remembered, is in turn relevant to the student's goals.)

The consumer's perceptions may represented as follows:



This diagram indicates the consumer's perception that learning objective O is relevant to a given concern of his as a consumer and that student S is relevant to meeting this concern if S masters O. This relationship is relatively simple to grasp in case a consumer is an employer and has no particular interest in the student beyond his ability to perform in a given manner. However, a parent is also very much a consumer of the educational product, and here the relationship between C, S, and O is somewhat different. Here the consumer (parent) is primarily interested in S and sees O as a means to having his goals for S realized. This need not interfere with the basic utility of the diagram, however, in representing the perception by C that O is relevant for S in order to achieve a predetermined goal for C. In other words, either the employer or the parent may be accommodated within the diagram.

The educational agency may be added to the consumer's perceptions in the following manner:



This subsystem represents the perception of the consumer that learning objective O, which is relevant to a given concern of his, may be learned through educational agency E by student S, who may be instrumental in meeting the given concern of consumer C.

It was mentioned earlier (p. 19) that the arrows in the diagrammatic model might be used to indicate either perceptions of relevance/irrelevance or attainability/unattainability. Of particular concern are perceptions of objective O by S and E as attainable or unattainable. The S⟶O relation as a perception of attainability has been discussed (see pp. 16-17). The E⟶O relation is also important in this respect, for O will never be included in the curriculum as an accepted objective of the school system if E does not perceive O to be attainable by S. The C⟶O relation may also represent a perception of attainability, i.e., the consumer's perception that a particular student can master a particular objective. However, whether or not a given student or type of student can master a given objective is primarily a matter that hinges on the perceptions of E and S.

A basic proposition underlying the operation of the model is that the perceptions of E, S, and C about O must be congruent for the educational system to function effectively and efficiently as an integral institutional component of the larger social system (Assumption 4). To the extent that the learner, the educational agency, and the consumer of the educational product disagree as to the relevance or attainability of learning objectives, the educational system is dysfunctional. Therefore, any instance in which two of the three relevant reference groups, E, S, and C, differ in their perceptions of the relevance and/or attainability of a learning objective may be said to constitute a symptom of educational need.

It should be stressed that the basic objective of the assessment model is not to prevent disagreement or to label it as undesirable. Rather it is the intent of the model to discover and define areas of disagreement for the purpose of using this information to improve the functioning of the educational system. Behind this approach is the assumption that disagreement between groups of persons is a symptom that can be used to diagnose a need and provide direction in determining a way of meeting the need. Areas of disagreement are considered to be "signals" that there are problems requiring solution if the educational system is to operate efficiently and effectively. The model is designed to search for areas of disagreement, not in random fashion, but by directing inquiry systematically toward the very heart of the learning process itself.

The possible patterns of disagreement or discrepancy in perception of O may be represented as in Table 1. It may be seen that there are eight possible types of discrepancy when a binary system of classification (in this case + and -) is used. The perception of relevance will be considered first.

Type I. Here there is no problem. The school system, the student, and the consumer all share a perception of the relevance of a learning objective, and the system is functioning well.

Types II and III. These two types will be considered together because they represent what are perhaps the most common situations. In Type II, the student perceives an objective to be irrelevant to his own goals, but the consumer, previously picked by the student, agrees with the educational agency and perceives the objective as relevant if the student wishes to involve himself with a given concern of the consumer. The problem here is primarily to demonstrate the relevance of the objective to the student, or else to suggest that he change the goal that led to his selection of the consumer. In Type III, the consumer agrees with the student's perception that the objective is irrelevant, and the appropriate action to be taken apparently is to remove the objective from the curriculum.

Type IV. This type indicates a loss of relevance perceived only by the consumer. The irrelevance has not come to the attention of either the student or the school system. Ideally, Type IV would eventually change to Type V and then to Type VIII. The latter type represents concurring perceptions of irrelevance among the three groups, and there would be no problem. In practice, this seldom happens.

Types V and VI. These types will be treated together because, like II and III, they each indicate a discrepancy between the school system and the student that may be interpreted in the light of consumer perceptions. In both types V and VI, the student has expressed a desire for an objective that is not in the curriculum, or is not part of the school system's offering. In Type V, the consumer does not perceive the objective to be relevant to his concerns, and again the problem is essentially one of demonstrating for the student that the objective is irrelevant. In Type VI, the student's perception of relevance is verified by the consumer, and the objective should be instituted in the system.

TABLE I

A Classification System for Symptoms of Educational Need in Terms of Types of Discrepancy in Perception between Reference Groups

Reference Group	Types I	II	III	IV	V	VI	VII	VIII
E	+	+	+	+	−	−	−	−
S	+	−	−	+	+	+	−	−
C	+	+	−	−	−	+	+	−

Type VII. This type represents an emerging educational need, one perceived by a consumer, or an expert representing a consumer, but not yet perceived by either the student or the educational system. The need may reflect a current consumer concern or one that is derived from projections into the future. It is necessary in this case to bring the emergence of the need to the attention of the educational system (and perhaps other groups of consumers as well) so that it may be considered as a possible future learning objective of the system. Type VII may change in time into either Types II or VI. Ideally, it would eventually become Type I.

Type VIII. This type has already been referred to briefly in considering Type IV. As in Type I, there is no disagreement among reference groups in Type VIII. Each group perceives the irrelevance of a given objective O. Obviously, if each group perceives O to be irrelevant, it never becomes a part of the data generated by the inquiry system.

Table I deals only with perceptions of relevance. A similar table may be constructed to represent patterns of perceived attainability/unattainability for any given learning objective. Since the consumer is not primarily concerned with the attainability of any given learning objective (see p.23) this matrix would contain only four types of discrepancy. If only E and S in Table 1 are considered, and types III, IV, V, and VIII are examined, the possible patterns of discrepancy in the perception of attainability may be seen.

In Type III, the school system perceives the objective as attainable, but the student does not, showing that either the objective must be revised or eliminated, or instruction related to that objective must be revised. In Type IV, both the school system and the student perceive the objective as attainable, and the system should be functioning well, given correspondence in perceptions of relevance also. In Type V, the school system perceives the objective to be unattainable, but the student perceives that he could attain it, showing that the objective probably ought to be included in the curriculum, again given the appropriate conditions of relevance as described earlier. Type VIII represents agreement between the school system and the student that the objective is unattainable. Again given relevance, the appropriate action is to design an instructional system that will make the objective attainable, or revise the objective, or eliminate it altogether.

It should be remembered that there is an order of priority between these two conditions of relevance and attainability, for it is only after the condition of relevance has been met that attainability becomes a requirement. The irrelevant objective, obviously, need not be attainable. Relevance must be dealt with before attainability has any significance.

This typology is to be used to classify symptoms of educational need as defined on p.2. Within each type, individual objectives, or different clusterings of objectives, may be rank ordered according to one or more indices of criticality, as presented on p.6. The presentation of needs can be made as detailed or as summarized as desirable in order to provide maximum utility at the decision-making level to be served. The same raw data may be used to serve more than one decision-making level, depending upon the criteria for clustering objectives. Individual objectives as formulated by teachers may be used for decision-making

at the classroom level. Objectives may be grouped by course, by general subject matter area, by type of student, or by any other variable for which data are collected and processed in the operation of the model. Whatever the criteria for clustering employed, a ranking according to the criticality of the need identified may be used to further structure the data. When cost factors are added, the results will meet the requirements established for statements of need on page 4.

7. Has the model been tested?

The model is currently being field tested on a limited scale in four counties north of San Francisco served by the North Bay PACE Center, Napa, California. The four counties are Marin, Sonoma, Napa, and Solano. In order to build on an earlier needs study conducted in the four counties (Kase, 1967), vocational education was selected as the curricular area in which the model might first be tried. The study by Kase had indicated that vocational education was the curricular area of top priority concern within the four counties. The selection of vocational education for study seemed appropriate also because this curricular area lends itself to the development of behavioral objectives more readily than do most others.

Procedures. To obtain behavioral objectives from teachers, all the vocational education teachers in the four counties were invited to attend one of two four-day workshops to learn to write behavioral objectives. In the workshops, teachers were asked to write up to 10 behavioral objectives for any vocational course they were teaching at the time. The emphasis was on quality, rather than quantity. In order to complete their workshop assignment, teachers submitted their objectives to their own vocational classes and measured student perceptions of the objectives, using an instrument designed especially for the purpose.

It has been pointed out that the model does not call specifically for instructing teachers in writing behavioral objectives (p.15). However, there were three reasons for supposing that conducting the workshops was worthwhile. First, it provided for taking a major step forward in improving instruction at the outset of the process. Secondly, it provided the teachers with the sense that the assessment of needs was to aid them in doing their job, rather than simply to assess them or their work. Emphasis in the workshops was placed on the diagnostic value of the instrument used to measure student perceptions of objectives. Thirdly, it was considered desirable to make the process of assessing needs as much a part of the ongoing operation of the educational system as possible. Therefore, it was thought that the teachers should administer the questionnaire to their own students. The workshop milieu provided for some degree of control over the teacher administration of the instruments and the logistics of gathering the data over the four counties.

There were 60 teachers who volunteered to participate in the workshops, representing 19 different vocational education courses in the industrial and technical area, home economics, agriculture, and business. There were 13 school districts represented.

The instrument used to measure student perceptions of teacher-formulated behavioral objectives contained five semantic differential items of a modified type. (For a full description of the semantic differential, see Osgood, Suci, and Tannenbaum, 1957.) A copy of the questionnaire is presented on p.31. The first four items were designed to measure different aspects of perceived relevance. The fifth item was designed to tap the dimension of perceived attainability. The items were constructed very simply, since many of the students, if not most, were underachieving secondary school students, often with considerable language difficulty.

It will be recalled that, in discussing agreement among reference groups in the perception of objectives, relevance was treated as a dichotomy, i.e., either an objective is perceived as relevant, or it is perceived as irrelevant. In the real world, relevance is generally a matter of degree, rather than a dichotomy. Therefore, the scales used to measure student perceptions of relevance were interval scales, and the same scales will be used to measure consumer perceptions of relevance modifed to reflect the consumers' point of view. Disagreement between student and consumer will be measured, therefore, in terms of the magnitude of discrepancy on the relevancy scales.

Since a teacher proposed each objective initially, the tentative assumption is made that the objective is highly relevant from the point of view of the educational system. If we then assume maximum relevance for the educational system, it is possible to compute the magnitude of discrepancy between the educational system and a student or a consumer. Discrepancies may be classified according to the typology in Table 1 through the relative positions of E, S, and C on a scale. If it is found desirable, the scales may be dichotomized during the analysis.

Just what final index of relevance will be developed from the questionnaires must be determined empirically by seeking the highest predictive power in respect to the students success or failure in attaining given learning objectives.

Plans are currently under way to complete the field test of the model by conducting a survey among consumers of the educational product. The consumer study will be directed toward a sampling of employers and employees using the kinds of skills taught in the courses for which behavioral objectives were developed in the workshops. Objectives generated by the teachers will be presented to employers and employees during interviews, and their perceptions of the relevance of specific objectives to their concerns will be obtained.

Analysis of data. After completion of the workshops, teachers were mailed an evaluation questionnaire, which they were to fill out and return unsigned. Of the 60 participating teachers, 41 returned the questionnaire. Almost all of the responding teachers, 39 of the 41 reported that they felt the workshop experience had changed their work as classroom teachers in some way, and 38 of the teachers felt that they knew more about what they were trying to accomplish than previously. Further, 38 of the teachers felt that they would continue to write objectives in behavioral terms. All 41 teachers said they would recommend the workshop to fellow teachers if it were available, a factor

of particular significance for the future of this approach to needs assessment.

The greatest uncertainty reported by the teachers had to do with whether or not the workshop made any significant difference where students were concerned. Of the 41 teachers responding, 15 reported that they felt they were better understood by their students after writing their objectives behaviorally, 4 teachers felt they were not understood better, and 22 reported that they really did not know.

These evaluative data, of course, were based entirely upon the perceptions of the teachers following the workshops. No attempt was made to obtain other types of data on teacher uses of objectives. Interesting results related to this topic were reported by Popham and Baker (1967). These investigators found a positive relationship between measures of teacher attitude toward behavioral objectives and observed teacher use of behavioral objectives in the classroom. The Popham and Baker results are consistent with teacher self-reports in the present study.

The product of the two workshops, a listing of objectives formulted by the 60 vocational education teachers, has been compiled and edited by Kase (1969).

Analysis of the data from students is not yet complete. However, preliminary analysis does indicate that the students were discriminating among objectives in responding to the five-item questionnaire. In a photography course, for example, students expressed a dislike for an objective on the history of photography, but were very much interested in darkroom experience. In a home economics course on clothing, students were very favorable toward making clothes, but tended to reject an objective on testing and identifying types of fabric in a laboratory setting. In neither of these two instances, did the students generally feel they could not attain the objective. Interestingly enough, the objective on photographic history was also considered to be not particularly useful by the student, but the objective on testing fabrics was considered quite useful. Apparently the students just did not like the idea of doing the laboratory work, when they would prefer to be actually making clothes. Analyses so far indicate that very useful information may be obtained by making comparisons among responses to items---particularly the items on liking an objective, its perceived usefulness, and its perceived attainability.

Of particular importance to the validity of this approach to assessing needs is the finding from preliminary analysis that there is a positive relationship between student perceptions of a course objective and teacher-assigned grades in the course. At present the findings are very tentative, and no causality may be attributed. It is not clear whether the student grades were influenced by the level of understanding and acceptance of objectives, or whether the students' anticipation of their grade may have in fact influenced their perceptions of objectives, or whether perhaps there was a two-way interaction between the two types of variable. In any event, examination of the data so far appears promising.

In respect to analysis of the data, it should be remembered that considerable emphasis in the workshops was placed on the teacher's use of the instrument for diagnosing and predicting learning difficulties in the class. Teachers were

shown how to quickly tabulate the results for each class, developing a distribution or profile of responses to each item for each objective. Further, profiles could be developed for each student across objectives. Since the amount of data that any one teacher would wish to handle would be relatively small, hand tabulation produced the desired results.

In Conclusion

There is much work yet to be done in refining the model and validating it. For example, much work will be required in refining the concept of consumer of the educational product and methods for handling consumer data. The concept of the consumer at lower grade levels requires refinement. Is the appropriate consumer of the educational product at one grade level, the teacher and student at the next higher grade level? Or in the case of the nongraded school, should consumer expectations perhaps be defined in terms of the success/failure patterns of similar students the following year of school, determined on a probabilistic basis?

A number of questions need answering. What should be done, for instance, when consumers of the same type disagree among themselves as to the relevance of an objective? Is this another kind of discrepancy that must be resolved before the school system can act? Or should the school system act in terms of the expectations of only the most important consumers when there is disagreement?

Further, how are student perceptions of relevance to be measured at lower grade levels? It is too much to expect primary level pupils to see intrinsic rewards involved in each and every learning objective. Yet it seems reasonable to assume that relevance in some form must be established if learning is to take place.

Though there are questions yet to be answered, it would appear that an operating model of this kind is essential if we in education are ever to engage in truly systematic problem-solving. Even though the model proposed here would generate massive quantitites of information, there is a homogeneity about the data that would make processing it quite feasible using modern data-processing techniques.

Perhaps the primary strength of the model is that it generates data at the level of most meaningful activity in terms of the overall goal of the educational system to educate children. Elements of data may be combined and synthesized and filtered upward through the system from one decision-making level to another, but each higher order of synthesis is still firmly anchored in and reducible to the original elements of data that were generated in the classroom. All decision-making levels, therefore, are presented with data from a common base. If the educational hierarchy is ever to function as a true system, this common base of information is essential.

THE QUESTIONNAIRE USED TO MEASURE STUDENT PERCEPTIONS OF LEARNING OBJECTIVES

Student Number_____

Please Circle One: 1 Female 2 Male

Grade Level_____

Objective:

_____

_____

_____

Placing an X on a line somewhere between each pair of opposite statements below shows how you feel about the above learning objective.

1. I'd <u>like</u> to learn to do it.	:___:___:___:___:___:___:___:	I <u>wouldn't like</u> to learn to do it.	Don't know____
2. I <u>don't need</u> to learn to do it.	:___:___:___:___:___:___:___:	I <u>need</u> to learn to do it.	Don't know____
3. If I learn it, I'd <u>use</u> it.	:___:___:___:___:___:___:___:	If I learn it, I <u>wouldn't use</u> it.	Don't know____
4. I <u>shouldn't</u> learn to do it.	:___:___:___:___:___:___:___:	I <u>should</u> learn to do it.	Don't know____
5. I <u>can</u> learn to do it.	:___:___:___:___:___:___:___:	I <u>can't</u> learn to do it.	Don't know____

If there is anything else you would like to say about the above objective, use the following space:

What kind of work would you like to do after you finish school?

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